

April 17, 2019

Jason Griscom, PE

STV

900 W Trade Street Charlotte, NC 28202

Project: 15406.2009455 (SF-080036)

County: Robeson

Project Description: Emergency Bridge Replacement of Bladen County Bridge No. 36

Site Description: Bridge No. 36 on -L- (SR 1747) Over Kitchen's Branch

Subject: Foundation Recommendations

Dear Mr. Griscom:

As authorized, Falcon Engineering Inc. (Falcon) has completed the Structure Foundation Recommendations for the above referenced project based on current NCDOT LRFD bridge design policy and procedures.

Foundation recommendations, notes on plans, and pay item quantities are presented in the attachments. These recommendations are based on subsurface data obtained by others as presented in the Subsurface Investigation Report. Structure foundation loads considered in our analyses were based on Standard Load Tables.

Falcon appreciates the opportunity to have provided STV with geotechnical engineering services. If you have any questions concerning the contents of this report or need additional information, please do not hesitate to contact our office.

Respectfully submitted:

FALCON ENGINEERING, INC.

Stephen Crockett, PE

Geotechnical Engineer

Jeremy R. Hamm, PE

Geotechnical Engineering Manager

Attachments: Foundation Recommendations

Notes on Plans Pay Item Quantities

# **FOUNDATION RECOMMENDATIONS**

Prepared for NCDOT by: Falcon Engineering

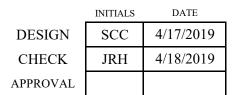
WBS # DF15406.2009455

T.I.P. NO. SF-080036

COUNTY Bladen

STATION 13+97 -L-

DESCRIPTION Bridge No. 36 on -L- (SR 1747) Over
Kitchen's Branch





	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	13+60.88 -L-	Cap on HP 12x53 Steel Piles	100 tons/pile	Bottom of Cap Elev. = 46.9 ft Estimated Length of Pile = 70 ft Number of Vertical Piles = 5 Pile Spacing = 8 feet 3 inches
END BENT NO. 2	14+33.13 -L-	Cap on HP 12x53 Steel Piles	100 tons/pile	Bottom of Cap Elev. = 47.6 ft Estimated Length of Pile = 70 ft Number of Vertical Piles = 5 Pile Spacing = 8 feet 3 inches

TIP # SF-080036 County Bladen

#### FOUNDATION RECOMMENDATION NOTES ON PLANS

- 1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2. PILES AT END BENTS NO. 1 AND NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- 3. DRIVE PILES AT END BENTS NO. 1 AND NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- 4. TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

#### FOUNDATION RECOMMENDATION COMMENTS

- 1. 1.5:1 (H:V) slopes at both end bents are ok with slope protection.
- 2. The factored axial load at End Bents No. 1 and No. 2 is 97 tons per pile.
- 3. Recommend Type II Modified Bridge Approach Fills. See 2018 Roadway Standard Drawing 422.02.

## **PILE PAY ITEMS**

(Revised 8/15/12)

WBS ELEMENT	DF15406.2009455	DATE	4/17/2019			
TIP NO.	SF-080036	DESIGNED BY	SCC			
COUNTY	Bladen	CHECKED BY	JRH			
STATION	13+97 -L-	_				
DESCRIPTION	Bridge No. 36 on -1	– L- (SR 1747) Over				
<u>-</u>	Kitchen's Branch					
NUMBE	R OF BENTS WITH PILES	_ ) [0.1				
NUM	BER OF PILES PER BENT	Only required for "Predrilling for Piles" & "Pile				
NUMBER OF	END BENTS WITH PILES	Excavation" pay items				
NUMBER (	OF PILES PER END BENT					

Г		PILE PAY ITEM QUANTITIES						
		Steel				Pile Excavation		
l		Pile	Pipe Pile	Predrilling	Pile	(per linear ft)		PDA
	Bent # or	Points	Plates	For Piles	Redrives	In	Not In	Testing
	End Bent #	(yes/no)	(yes/no/maybe)	(per linear ft)	(per each)	Soil	Soil	(per each)
	End Bent # 1	no			3			
	End Bent # 2	no			3			\ /
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### Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.